

What is claimed is:

1. A method of preparing an image for imprinting on a soft surface comprising the steps:

providing an image on an image side of a heat transfer paper, said image comprising an

5 ink compound;

applying powder to the image; and

applying heat to the heat transfer paper after applying the powder to the image;

wherein the ink compound comprises ink and aromatic polyisocyanates.

2. The method of Claim 1, wherein the ink compound comprises ink and aromatic polyisocyanates in a ratio of at least approximately 2 parts ink to 1 part aromatic polyisocyanates.

3. The method of Claim 1, wherein the heat is applied to the heat transfer paper for at least approximately 2 seconds at a temperature of at least approximately 100 degrees Fahrenheit.

4. The method of Claim 1, wherein the image is provided on the image side of the heat transfer paper by passing the ink compound through a screen onto the image side of the heat transfer paper.

5. The method of Claim 1, wherein the powder comprises thermoplastic copolyamides.

6. The method of Claim 1, wherein the ink comprises polyvinyl chloride plastisol silk screen ink.

7. The method of Claim 3, wherein the image is provided on the image side of the heat transfer paper by passing the ink compound through a screen onto the image side of the heat transfer paper.

8. The method of Claim 1, further comprising the steps of:

5 positioning the image side of the heat transfer paper against a soft surface;

applying heat and pressure to the heat transfer paper against the surface, causing the heat transfer paper with the ink compound and the powder thereon to attach to the surface; and

removing the heat transfer paper from the surface after applying the heat and the pressure to the heat transfer paper against the surface, in a manner such that the image remains on the surface.

9. The method of Claim 8, further comprising the step of applying heat to the surface after removing the heat transfer paper from the surface.

10. The method of Claim 9, wherein heat is applied to the surface after removing the heat transfer paper from the surface, for at least approximately 10 seconds at a temperature of at least approximately 220 degrees Fahrenheit.

11. The method of Claim 9, wherein the heat is applied to the heat transfer paper after applying the powder to the image, for at least approximately 2 seconds at a temperature of at least approximately 100 degrees Fahrenheit.

12. The method of Claim 9, wherein heat is applied to the surface in a curing tunnel.

20 13. The method of Claim 8, further comprising the step of ensuring the temperature of the surface is at least as low as 180 degrees Fahrenheit before removing the heat transfer paper.

14. The method of Claim 8, wherein the pressure applied is at least approximately 30 pounds per square inch.

15. The method of Claim 8, wherein the pressure is applied for at least approximately 2 seconds.

5 16. The method of Claim 8, wherein the pressure is applied at a temperature of at least approximately 150 degrees Fahrenheit.

17. The method of Claim 8, wherein the pressure applied is within a range of approximately 30-120 pounds per square inch, and the pressure is applied for approximately 2-40 seconds at a temperature within a range of approximately 150-400 degrees Fahrenheit.

18. The method of Claim 8, wherein the surface is on a consumer article, and further comprising the step of securing the consumer article to an apparatus before positioning the image side of the heat transfer paper against the surface.

19. A method of preparing a multi-color image for imprinting on a soft surface comprising the steps:

forming a first image on an image side of a heat transfer paper using a first ink compound;

forming a second image on the image side of the heat transfer paper using a second ink compound, after forming the first image;

verifying heat is applied to the heat transfer paper before forming the first image thereon;

20 applying heat to the heat transfer paper after forming the first image but before forming the second image;

applying heat to the heat transfer paper after forming the second image;  
applying powder to the first and second images after forming the second image; and  
applying heat to the heat transfer paper after applying the powder to the first and second  
images;

5        wherein the first ink compound comprises ink and aromatic polyisocyanates; and  
      wherein the second ink compound comprises ink and aromatic polyisocyanates; and  
      wherein the first ink compound is a first color, and the second ink compound is a second  
color, whereby the first image and the second image together form a multi-color image.

10        20.    The method of Claim 19, wherein the first ink compound comprises ink and  
aromatic polyisocyanates in a ratio of at least approximately 2 parts ink to 1 part aromatic  
polyisocyanates, and wherein the second ink compound comprises ink and aromatic  
polyisocyanates in a ratio of at least approximately 2 parts ink to 1 part aromatic  
polyisocyanates.

15        21.    The method of Claim 19, wherein the heat is applied to the heat transfer paper  
after forming the first image but before forming the second image, and after forming the second  
image, each for at least approximately 2 seconds at a temperature of at least approximately 100  
degrees Fahrenheit.

22.    The method of Claim 19, wherein the powder comprises thermoplastic co-  
polyamides.

20        23.    The method of Claim 19, wherein the ink comprises polyvinyl chloride plastisol  
silk screen ink.

24. The method of Claim 19, wherein the first image is formed on the image side of the heat transfer paper by passing the first ink compound through a first screen onto the image side of the heat transfer paper, and wherein the second image is formed on the image side of the heat transfer paper by passing the second ink compound through a second screen onto the image side of the heat transfer paper.

25. The method of Claim 19, wherein the heat is applied to the heat transfer paper after applying the powder to the multi-color image, for at least approximately 2 seconds at a temperature of at least approximately 100 degrees Fahrenheit.

26. The method of Claim 19, further comprising the steps:  
positioning the image side of the heat transfer paper against a soft surface;  
applying heat and pressure to the heat transfer paper against the surface, causing the heat transfer paper with the first ink compound, the second ink compound, and the powder thereon, to attach to the surface; and  
removing the heat transfer paper from the surface after applying the heat and the pressure to the heat transfer paper against the surface, in a manner such that the multi-color image remains on the surface.

27. The method of Claim 26, further comprising the step of applying heat to the surface after removing the heat transfer paper from the surface.

28. The method of Claim 27, wherein heat is applied to the surface after removing the heat transfer paper from the surface, for at least approximately 10 seconds at a temperature of at least approximately 220 degrees Fahrenheit.

29. The method of Claim 27 wherein heat is applied to the surface in a curing tunnel.

30. The method of Claim 26, wherein the heat is applied to the heat transfer paper after applying the powder to the multi-color image, for at least approximately 2 seconds at a temperature of at least approximately 100 degrees Fahrenheit.

31 The method of Claim 26 further comprising the step of ensuring the temperature  
5 of the surface is at least as low as 180 degrees Fahrenheit before removing the heat transfer paper.

32. The method of Claim 26 wherein the pressure applied is at least approximately 30 pounds per square inch.

33. The method of Claim 26, wherein the pressure is applied for at least approximately 2 seconds.

34. The method of Claim 26, wherein the pressure is applied at a temperature of at least approximately 150 degrees Fahrenheit.

35. The method of Claim 26, wherein the pressure applied is in a range of approximately 30-120 pounds per square inch, and the pressure is applied for approximately 2-40 seconds at a temperature within a range of approximately 100-400 degrees Fahrenheit.

36. A method of imprinting an image on a soft surface comprising the steps:  
providing an image on an image side of a heat transfer paper;  
positioning the image side of the heat transfer paper against a surface;  
applying heat and pressure to the heat transfer paper against the surface, causing the heat  
20 transfer paper with the image thereon to attach to the surface; and

removing the heat transfer paper from the surface after applying the heat and the pressure to the heat transfer paper against the surface, in a manner such that the image remains on the surface;

wherein the image is formed on the image side of the heat transfer paper using an ink compound, and is coated with a powder and then heated for at least approximately 2 seconds at a temperature of at least approximately 100 degrees Fahrenheit, prior to positioning the image side of the heat transfer paper against the surface; and

wherein the ink compound comprises ink and aromatic polyisocyanates.

37. The method of Claim 36, further comprising the step of applying heat to the surface after removing the heat transfer paper from the surface.

38. The method of Claim 37, wherein heat is applied to the surface after removing the heat transfer paper from the surface, for at least approximately 10 seconds at a temperature of at least approximately 220 degrees Fahrenheit.

39. The method of Claim 36, wherein the ink compound comprises ink and aromatic polyisocyanates in a ratio of at least approximately 2 parts ink to 1 part aromatic polyisocyanates.

40. The method of Claim 36, wherein the powder comprises thermoplastic copolyamides.

41. The method of Claim 36, wherein the ink comprises polyvinyl chloride plastisol silk screen ink.

42. A method of imprinting a multi-color image on a soft surface comprising the steps:

forming a first image on an image side of a heat transfer paper using a first ink compound;

forming a second image on the image side of the heat transfer paper using a second ink compound, after forming the first image;

5 wherein the first ink compound is a first color, and the second ink compound is a second color, whereby the first image and the second image together form a multi-color image;

verifying heat is applied to the heat transfer paper before forming the first image thereon;

applying heat to the heat transfer paper after forming the first image but before forming the second image, for at least approximately 2 seconds at a temperature of at least approximately 100 degrees Fahrenheit;

applying heat to the heat transfer paper after forming the second image, for at least approximately 2 seconds at a temperature of at least approximately 100 degrees Fahrenheit;

applying powder to the multi-color image;

applying heat to the heat transfer paper after applying the powder to the multi-color image, for at least approximately 2 seconds at a temperature of at least approximately 100 degrees Fahrenheit;

positioning the image side of the heat transfer paper against a surface;

applying heat and pressure to the heat transfer paper against the surface, causing the heat transfer paper with the first ink compound, the second ink compound, and the powder thereon, to

20 attach to the surface; and



removing the heat transfer paper from the surface after applying the heat and the pressure to the heat transfer paper against the surface, in a manner such that the multi-color image remains on the surface;

wherein the first ink compound comprises ink and aromatic polyisocyanates; and

5 wherein the second ink compound comprises ink and aromatic polyisocyanates.

43. The method of Claim 42, further comprising the step of applying heat to the surface after removing the heat transfer paper from the surface.

44. The method of Claim 43, wherein heat is applied to the surface after removing the heat transfer paper from the surface, for at least approximately 10 seconds at a temperature of at least approximately 220 degrees Fahrenheit.

45. The method of Claim 42, wherein the first ink compound comprises ink and aromatic polyisocyanates in a ratio of at least approximately 2 parts ink to 1 part aromatic polyisocyanates, and wherein the second ink compound comprises ink and aromatic polyisocyanates in a ratio of at least approximately 2 parts ink to 1 part aromatic polyisocyanates.

46. The method of Claim 42, wherein the powder comprises thermoplastic copolyamides.

47. The method of Claim 42, wherein the ink comprises polyvinyl chloride, plastisol silk screen ink.

20 48. The method of Claim 42, further comprising the step of ensuring the temperature of the surface is at least as low as 180 degrees Fahrenheit before removing the heat transfer paper.

49. The method of Claim 42, wherein the pressure applied is at least approximately 30 pounds per square inch, for at least approximately 2 seconds, at a temperature of at least approximately 100 degrees Fahrenheit.

50. The method of Claim 42, wherein the pressure applied is in a range of  
5 approximately 30-120 pounds per square inch, and the pressure is applied for approximately 2-40 seconds at a temperature within a range of approximately 100-400 degrees Fahrenheit.

2022-05-01 10:50:00